

What is claimed is:

1. A surface treatment apparatus comprising:
  - a sheet heating unit which heats a sheet containing at least a thermoplastic resin layer; and
  - a sheet depression and protrusion-forming unit disposed on a downstream process side of the sheet heating unit which forms depressions and protrusions on the thermoplastic resin layer.
2. A surface treatment apparatus according to Claim 1, wherein the sheet heating unit which heats the sheet at a temperature equal to or higher than the softening point of a thermoplastic resin in the thermoplastic resin layer.
3. A surface treatment apparatus according to Claim 1, wherein a thermoplastic resin forming the thermoplastic resin layer is a polyethylene resin.
4. A surface treatment apparatus according to Claim 1, wherein the sheet comprises the thermoplastic resin layer and an image-forming layer on a base, and
  - depressions and protrusions are formed on the image-forming layer surface and at the interface of the image-forming layer with the thermoplastic resin layer by the sheet depression and protrusion-forming unit.

5. A surface treatment apparatus according to Claim 1, wherein the sheet depression and protrusion-forming unit forms depressions and protrusions at a temperature equal to or higher than the softening point of a thermoplastic resin in the thermoplastic resin layer.
6. A surface treatment apparatus according to Claim 1, wherein at least one of a depression depth, a protrusion height, and a depression and protrusion surface density can be adjusted.
7. A surface treatment apparatus according to Claim 6, wherein the protrusion height is 10 to 100 $\mu$ m, and a depression and protrusion interval is 10 to 300 $\mu$ m.
8. A surface treatment apparatus according to Claim 1, wherein at least one of a depression depth, a protrusion height, and a depression and protrusion surface density can be adjusted according to customer specifications.
9. A surface treatment apparatus according to Claim 1, wherein the sheet depression and protrusion-forming unit forms depressions and protrusions of different shapes in different parts of the sheet according to the image to be formed on the sheet.

10. A surface treatment apparatus according to Claim 1, wherein the sheet depression and protrusion-forming unit selectively drives plural wires by an actuator, and depressions and protrusions are formed by giving impacts to the sheet surface with the wires each comprising a depression and protrusion-forming member attached to the end thereof.

11. A surface treatment apparatus according to Claim 10, wherein the sheet depression and protrusion-forming unit is a magnetic moving type dot impact printer head.

12. A surface treatment apparatus according to Claim 1, wherein the sheet depression and protrusion-forming unit is a roller having surface depressions and protrusions against the sheet.

13. A surface treatment apparatus according to Claim 1, wherein the sheet is selected from a thermosensitive recording sheet, an inkjet sheet, an electrophotographic sheet, a hot developing sheet, a silver halide photography sheet, and a silver halide digital photography sheet.

14. An image-forming apparatus comprising:  
an image-forming unit which forms a visible image on a sheet, and  
a surface treatment unit, comprising;

a sheet heating unit which heats the sheet comprising at least a thermoplastic resin layer, and

a sheet depression and protrusion-forming unit disposed on the downstream process side of the sheet heating unit which forms depressions and protrusions on the thermoplastic resin layer, the surface treatment unit performing surface treatment of the sheet on which an image is formed by the image-forming unit.

15. An image-forming apparatus according to Claim 14, wherein the sheet heating unit which heats the sheet at a temperature equal to or higher than the softening point of a thermoplastic resin in the thermoplastic resin layer.

16. An image-forming apparatus according to Claim 14, wherein the sheet comprises the thermoplastic resin layer and an image-forming layer on a base, and

depressions and protrusions are formed on the image-forming layer surface and at the interface of the image-forming layer with the thermoplastic resin layer by the sheet depression and protrusion-forming unit.

17. An image-forming apparatus according to Claim 14, wherein the sheet depression and protrusion-forming unit forms depressions and protrusions at a temperature equal to or higher than the

softening point of a thermoplastic resin in the thermoplastic resin layer.

18. An image-forming apparatus according to Claim 14, wherein the sheet depression and protrusion-forming unit forms depressions and protrusions of different shapes in different parts of the sheet according to the image to be formed on the sheet.

19. An image-forming apparatus according to Claim 14, wherein the sheet depression and protrusion-forming unit selectively drives plural wires by an actuator, and depressions and protrusions are formed by giving impacts to the sheet surface with the wires each comprising a depression and protrusion-forming member attached to the end thereof.

20. An image-forming apparatus according to Claim 19, wherein the sheet depression and protrusion-forming unit is a magnetic moving type dot impact printer head.

21. An image-forming apparatus according to Claim 14, wherein the sheet depression and protrusion-forming unit is a roller having surface depressions and protrusions against the sheet.

22. An image-forming apparatus according to Claim 14, further comprising:

a control unit which conducts one of driving and stopping driving the surface treatment unit so as to control an execution of surface treatment of the sheet.